REMARKS

Claims 1-20 will be pending upon entry of the present amendment. Claims 1 and 10 have been amended.

The Examiner has rejected claims 1-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner has cited the term "encapsulating an integrated circuit die into an integrated circuit package," of claim 1 in the rejection. Accordingly, claim 1 has been amended to remove the cited limitation. Claim 1 and dependent claims 2-13 and 20 are now allowable over § 112. Applicant notes that claims 14-19 do not depend from claim 1, and accordingly, should not be subject to the present rejection under § 112.

The limitations deleted from claim 1 in the present amendment were added thereto in a previous amendment. The amendment to claim 10 incorporates one of the limitations deleted from claim 1, from which claim 10 depends. Accordingly, the above amendments do not necessitate a further search on the part of the Examiner. Applicants respectfully request entry of the present amendment and consideration of the arguments presented below, inasmuch as these arguments address an apparent misunderstanding on the part of the Examiner.

The Examiner has rejected claims 1, 2, 7, 9, 11, 13, 14, 16, 17, 19, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Linn et al. (U.S. Patent No. 5,882,423, hereafter "Linn") in view of Dlugokecki (U.S. Patent No. 5,700,697). The Examiner has rejected claims 3, 4, 6, 8, 12, 13, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Linn in view of Dlugokecki and further in view of Arita et al. (U.S. Patent No. 6,418,941, hereafter "Arita"), claims 5 and 13 under 35 U.S.C. § 103(a) as being unpatentable over Linn in view of Dlugokecki and further in view of Chang et al. (U.S. Patent No. 5,043,299), and claims 10 and 15 under 35 U.S.C. § 103(a) as being unpatentable over Linn in view of Dlugokecki and further in view of Mitra et al. (U.S. Patent No. 6,232,153, hereafter "Mitra").

Applicants are of the opinion that the Examiner has not understood the term "noble gas ion plasma," as used in the present application. It is well known in the art that the list of known noble gases consists of the following: helium, neon, argon, krypton, xenon, and radon.

It is also known that a noble gas ion plasma cannot be formed in the presence of a reactive gas, but only in an atmosphere substantially consisting of one, or a combination of more than one of the noble gases.

Plasmas, as referred to in the present application and in the cited art, fall into two general categories: chemical and physical. Physical plasma is one in which the atoms are accelerated in a straight line toward a surface, thereby etching the surface, largely without discrimination as to the material of the surface. There is no chemical reaction necessary between the plasma gas and the surface being etched. Any plasma process performed employing a noble gas plasma can only be a physical plasma process, due to the non-reactive nature of the gas. On the other hand, any plasma process that includes a reactive component cannot be a noble gas plasma, inasmuch as the reaction requires the presence of a reactive (non-noble) gas.

In a chemical plasma, the atoms become disassociated and highly active. In such a state, the atoms react with impurities or oxides, which then become gaseous, or form an ash, which is easily removable from the treated surface. Gases in a chemical plasma etch are selected such that they are reactive with a first selected material, and sometimes such that they are non-reactive with a second selected material, so as to discriminate between the first and second materials. The process taught by Linn, for example, is a chemical plasma process. This is clear, first, from the choice of gases used in the plasma processes taught. Linn teaches three separate plasma gas mixtures: argon/oxygen (column 4, line 44), ammonia/hydrogen (column 4, line 46), and a fluorinated plasma (column 4, lines 59-63). It will be noted that each of these atmospheres includes at least one reactive gas (oxygen, ammonia, hydrogen, or fluorine, for example) selected for the purpose of chemically reacting with various contaminants. This is also clear in the detailed discussion of these reactions found in the text beginning at column 4, line 66, through column 5, line 34. Additionally, Linn's gases are selected to avoid any effect on the materials of the chip packages or metal components (see, for example, column 3, lines 5-7, 12-17, and 41-45, column 4, lines 52-54, and column 5, lines 19-21 and 27-31), and is thus chemically selective in nature.

Claim 1 recites, in part, "exposing said integrated circuit package to a noble gas ion plasma . . . ." In rejecting claim 1, the Examiner has cited Linn as teaching this limitation.

In particular, the Examiner cites column 6, lines 26-31, which states, "a second cleaning step of exposing the integrated circuit package to an oxygen and argon plasma atmosphere for a second period of time for removing contaminants from the integrated circuit package and for removing the carbonaceous material from and milling the integrated circuit package."

The passage of Linn cited by the Examiner as teaching a noble gas ion plasma teaches a blend of oxygen and argon. Inasmuch as oxygen is a known reactive gas, the atmosphere provided by Linn cannot produce a noble gas ion plasma, nor can any of the other atmospheres taught by Linn. Accordingly, Linn fails to teach a noble gas ion plasma, as recited in claim 1. Dlugokecki cannot provide the teaching that Linn lacks. Dlugokecki is silent with respect to the type of plasma etching used, but stresses that the underlying metal contacts should not be damaged during the removal of the encapsulating material (column 3, lines 24-28, for example), which suggests selectability, which in turn suggests a chemical plasma.

Even if Dlugokecki were sufficient to teach the use of a noble gas plasma etch, there is no motivation to combine Dlugokecki with Linn. Linn is directed to the treatment of microchip packages for use in production marking. See, for example, column 5, lines 16-18, in which Linn teaches the use of batch processing, generally a mass production process. In contrast, Dlugokecki is directed to the reconstruction of an existing microchip package for the purpose of placing a prototype chip therein for testing purposes, and, in contrast to Linn, is not directed to the treatment of the exterior of a chip package. Additionally, the method taught by Dlugokecki is intended to remove or deactivate an existing chip within a chip package, and prepare that package for a new chip (see, for example, column 2, lines 24-30, and 62 through column 3, line 4). Thus, a combination of Dlugokecki's process with Linn's would destroy the existing chips of Linn's process.

For at least the reasons stated above, Linn and Dlugokecki, either individually or in combination, fail to teach or suggest each and every limitation of claim 1, which is accordingly allowable thereover.

Inasmuch as the rejection of each of the claims depending from claim 1 relies on a combination of Linn and Dlugokecki to teach the limitations of claim 1, and inasmuch as Linn

Claim 14 recites, "exposing the package surface to a noble gas ion plasma." While the scope of claim 14 differs from that of claim 1, the discussion with reference to a noble ion gas plasma, as presented in support of claim 1, is also applicable with respect to the allowability of claim 14. Accordingly, claim 14 is allowable over Linn in combination with Dlugokecki. Furthermore, inasmuch as the rejections of claims 15-19 each depend on a combination of Linn with Dlugokecki to teach or suggest the limitations of claim 14, these claims, also, are allowable over the cited prior art.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are requested. In the event the Examiner believes there are outstanding issues that can be resolved by telephone conference, the Examiner is invited to contact applicants' undersigned representative at (206) 622-4900 in order to resolve prosecution of this application.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

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